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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,582	02/22/2001	Eiji Okamoto	9319S-000178	9306

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EXAMINER
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QI, ZHI QIANG

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/763,582	<b>Applicant(s)</b> OKAMOTO ET AL.	
	<b>Examiner</b> Mike Qi	<b>Art Unit</b> 2871	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 November 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-15 and 24-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-15 and 24-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 5 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 08313890 (Hidenori et al) in view of US 6,229,586 B1 (Data et al), US 5,220,444 (Mitsui et al) and US 5,850,276 (Ochi et al).

Regarding claims 1, 3 and 24-27, Hidenori discloses (abstract; Fig.9; paragraphs 0086 – 0090) that a substrate for a liquid crystal display wherein:

- substrate (49) having lower surface (first surface ) and upper surface (second surface) opposite the lower surface (first surface);
- the upper surface of the substrate having a planar region (flat area 50), and a roughened region (roughened area 51), the roughened region comprising microscopic peaks and valleys, and the planar region adjacent the roughened region (see Fig.9B);
- the heights of the tops of the peaks in the roughened region (51) are equal to or less than the plane of the planar region (50) (shows on the Fig.9B);
- a reflective board (52) (reflecting film) is formed on the roughened region (51) (see paragraph 0089);

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- the surface of the reflective board (52) (reflecting film) corresponding to the microscopic peaks and valleys of the roughened region (51), and resulting in a predetermined scattering characteristics during light reflection (see Figs.9B and 9C);

(concerning claim 24)

- because the substrate having roughened region and planar region, and the roughened region having microscopic peaks and valleys, so that the roughened region has a network-shaped; and forming such roughened region and planar region must use at least two compositions such as using photoresist and metal reflective layer to form such roughened region and the planar region.

Hidenori does not expressly disclose that:

- 1) a predetermined mark (metal film) (alignment mark) is formed on the planar region;
- 2) the reflecting film and the alignment mark are made of same metal film;
- 3) the alignment mark is separated from the reflecting film.

**Date** discloses (col.2, lines 57 – 63) that the alignment mark is formed on the planar region because the surface of the substrate is made flat (planar) in the alignment mark-forming region, and the substrate is glass substrate. Date further indicates (col.2, line 64 – col.3, line 3) that the alignment mark is easily recognized because many depressions and projections are not formed on the flat (planar) region, and the flat region is the alignment mark-forming region.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the substrate structure of Hidenori with the teachings of forming alignment mark on the planar region of the substrate as taught by Date, since the skilled in the art would be motivated for easily recognizing the alignment mark (col.2, line 64 – col. 3, line 3).

Hidenori and Date teach the invention set forth above except for that the predetermined mark (alignment mark) and the reflecting film are made of same metal film.

**Mitsui** discloses (col.1, line 40 – col.5, line 42; Figs.6, 8) that the flattened surface of the substrate (11) is covered with a metal layer such as an Ag (silver) layer (silver film formed on the planar region), and forming a metal thin layer on the uneven surface such as an Ag (silver) layer as reflecting film (col.3, lines 19-21, the metal film formed on the planar region and formed on the uneven region are the same metal), such that the optical characteristics improved and the economy in production obtained (see col.2, lines 18-22). As a general available knowledge, the alignment mark should be visible and using metal such as silver or aluminum having higher reflectivity would enhance the visibility.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the substrate structure of Hidenori and Date with the teachings of using same metal formed on the planar region and formed on the roughened region as taught by Mitsui, since the skilled in the art would be motivated for

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improving the optical characteristic and obtaining the economy in production (col.2, lines 18-23).

Hidenori, Date and Mitsui teach the invention set forth above except for that the alignment mark is separated from the reflection film.

**Ochi** discloses (col.6, lines 18-28; Figs.1-2) that the alignment marks (26 and 25) are provided on the non-display area (20B) are separated from the display area (20A). As a general available knowledge, the reflecting film is contributed to display image such as reflecting pixel electrode which is connected with wiring layers to apply signal, and the reflecting film must be provided in the display area. Ochi indicates (col.3, lines 44-48) that using alignment marks as a reference to align the two substrates, the pixel slit opening rate is improved (since the alignment marks are provided on the non-display area). Therefore, the alignment mark is separated from the reflecting film would improve the pixel slit opening rate so as to enlarge the display area (see col.3, lines 44-48).

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the substrate structure of Hidenori, Date and Mitsui with the teachings of arranging the alignment mark separated from the reflecting film as taught by Ochi, since the skilled in the art would be motivated for enlarging the display area (col.3, lines 43 – 48).

Regarding Claim 5, Hidenori discloses (Fig.9; paragraph 0089) that the wiring is formed on the flat area (50) (planar region).

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3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hidenori, Date, Mitsui and Ochi as applied to claims 1, 3, 5 and 24-27 above, and further in view of US 6,315,801 (Miyazaki et al).

Regarding claim 4, Hidenori, Date, Mitsui and Ochi teach the invention set forth above except for that the predetermined mark is a process control mark.

Miyazaki discloses (col.2, line 58 – col.3, line 15) that during mass production having several process (the process can be used in production of electrode plate or production of a liquid crystal display device), and in order to effectively perform these processes with high accuracy, it is available to apply process control marks, position alignment marks and apply various identification marks such as manufacture lot numbers, bar codes and the like for easy identification and manufacture control (see col.2, line 64 – col.3, line 3) .

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the substrate structure of Hidenori, Date, Mitsui and Ochi with the teachings of arranging a process control mark as taught by Miyazaki, since the skilled in the art would be motivated for achieving effectively perform the production process with a high accuracy (col.2, line 64- col.3, line 3).

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hidenori, Date, Mitsui and Ochi as applied to claims 1, 3, 5 and 24-27 above, and further in view of US 5,973,763 (Fujimura et al).

Regarding claim 6, Hidenori, Date, Mitsui and Ochi teach the invention set forth above except for that a sealant is formed in the planar region.

Fujimura discloses (col.1, lines 13- 30) that, generally, the first substrate and the second substrate are bounded though a seal material, and then the two substrates are adhered together by a certain pressure. Therefore, if the sealant is formed in a roughened region, the two substrates would be insufficiently sealed; and the sealant is formed in a planar region, the two substrates would be able to obtain a hermetical seal by a certain pressure. It is common and known in the art to form a sealant in a planar region as sealing the two substrates in a planar region would be easier to obtain a sufficient adhesion.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the substrate structure of Hidenori, Date, Mitsui and Ochi with the teachings of arranging the sealant in the planar region as taught by Fujimura, since the skilled in the art would be motivated for achieving a hermetical seal (see col.1, lines 13- 30).

5. Claims 7-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hidenori, Date, Mitsui and Ochi as applied to claims 1, 3, 5 and 24-27 above, and further in view of US 6,130,736 (Sasaki et al).

Regarding claims 7-13, Hidenori, Date, Mitsui and Ochi teach the invention set forth above except for that the maximum height  $R_y$ , the arithmetic mean roughness  $R_a$ , the ten-point average roughness  $R_z$ , and the mean wavelength  $S_m$  in the roughness region are in predetermined ranges, and the ranges are set as claimed.

Sasaki discloses (col.2, line 50 – col.7, line 59; col.8, line 33 – col.9, line 50; Fig.1) that the reflector member (15) having a surface roughness of  $1\text{ }\mu\text{m}$  or less and a



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width of the concave portion is 45  $\mu\text{m}$  or less (col.9, lines 47-50). Therefore, the roughened region must have a certain range to represent the roughness. Sasaki discloses (col.6, lines 51-65) that in accordance with the reflector having such corrugated surface, the reflecting efficiency is improved and a bright display screen is attained, and the reflecting direction can be set in a wider range. A certain roughness (such as the arithmetic mean roughness  $R_a$ ) would determine the maximum height of roughness  $R_y$ , the ten-point average roughness  $R_z$ , and the mean wavelength (i.e., the pitch of the roughness peak)  $S_m$ . Sasaki discloses (col.9, lines 33-50) that it is more preferable to set the surface roughness of the reflector at 1  $\mu\text{m}$  or less, i.e., the arithmetic mean roughness  $R_a$  is set at 1  $\mu\text{m}$  or less.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the substrate structure of Hidenori, Date, Mitsui and Ochi with the teachings of the surface roughness range as taught by Sasaki to develop a proper roughness value in order to obtain a proper reflection and scattering so as to improve the display quality, since the reflector having such corrugated surface, the reflecting efficiency is improved (see col.6, lines 51-65).

Regarding claims 14-15, the limitations are only given weight as intended use. Because any liquid crystal display device would comprise two substrates and a liquid crystal layer interposed between the two substrates; and any display can be used for any electronic apparatus, and that would have been at least obvious.

***Response to Arguments***

6. Applicant's arguments filed Nov.22, 2005 have been fully considered but they are not persuasive.

1) The reference Hidenori is relied on to teach (abstract; Fig.9; paragraphs 0086 – 0090) that the upper surface of the substrate having a planar region (flat area 50), and a roughened region (roughened area 51), the roughened region comprising microscopic peaks and valleys, and the planar region adjacent the roughened region (see Fig.9B).

2) The reference Date is relied on to teach (col.2, lines 57 – 63) that the alignment mark is formed on the planar region because the surface of the substrate is made flat (planar) in the alignment mark-forming region, and the substrate is glass substrate.

3) The reference Mitsui is relied on to teach (col.1, line 40 – col.5, line 42; Figs.6, 8) that the metal film formed on the planar region and formed on the uneven region are the same metal (such as silver), so that the optical characteristics improved and the economy in production obtained.

4) The reference Ochi is relied on to teach (col.6, lines 18-28; Figs.1-2) that the alignment marks (26 and 25) are provided on the non-display area (20B) are separated from the display area (20A) which the reflecting film is formed.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

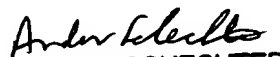
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi  
January 7, 2006

  
ANDREW SCHECHTER  
PRIMARY EXAMINER